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EXAMINER
LAI, ANDREW

ART UNIT	PAPER NUMBER
2616	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/518,824	BAEY ET AL.	
	Examiner	Art Unit	
	Andrew Lai	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-10* is/are rejected.

7)☒ Claim(s) *3* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/24/2005,12/21/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 second clause recites the limitation of "- *a step of determining from reference values, estimates of the individual quality factors ...*", and third clause recites "*... for deriving extrapolated updates of said reference values*".

It is unclear what specifically the *reference values* refer to. Throughout the Specification, the word "reference" was used in numerous places regarding "reference TFCs (transport format combination)". However, such "reference TFCs" do not appear to fit in the context of claim 3. In stead, it appears, in light of the Specification, that the "Expected TrCH performance curve" in fig. 3a reads on the phrase *reference values*, and the "Better estimation of TrCH current performance curve" in fig. 3b reads on the phrase *extrapolated updates of said reference values*. Therefore, Examiner would like to suggest revision for claim 3 being made as:

(clause 2)- *a step of determining from a reference performance curve, ...*

(clause 3) - *a step of ... for deriving extrapolated updates of said reference performance curve*.

If Applicants disagree to the above suggested revision, it is required that the Applicant revise the claim by at least clearly and distinctly point out what the *reference values* meant indicate.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1,2,8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freiberg et al (US 6,788,657, Freiberg hereinafter) in view of Higuchi et al (US 2002/0012383, Higuchi hereinafter).

The present application is drawn to an "Adaptive Rate Matching Method".

Freiberg discloses a "universal mobile telephone system [UMTS] network with improved rate matching method" (col. 1 lines 1-3) comprising the following features:

- **Regarding Independent Claims 1, 8 and 9**

Claim 1, *in a transmission system* (fig. 1, which "is a schematic view of a UMTS network" recited col. 1 line 66) *for transmitting simultaneously at a global transmission power, corresponding to a global quality factor on reception, a set of various multiplexed services* (refer to fig. 1 and see "in a UMTS network in which a plurality of services of a single user having different transmission power requirements are multiplexed in one channel and the technique of rate matching is applied" recited col. 1 lines 46-49, noting

that such "multiplexed in one channel" will necessarily result in *transmitting simultaneously at a global transmission power, corresponding to a global quality factor on reception*) *having specific predetermined error rate requirements* (see "required to achieve a desired Bit Error Rate" recited col. 1 lines 53-54) *matching individual quality factors* (see "deriving for each service the Energy per Bit per Noise density E_B/N_o required to achieve a desired Bit Error Rate" recited col. 1 lines 52-54, noting that "$(E_B/N_o)_i$ indicates a QoS of service i" recited col. 8 line 21) *achievable with adequately adjusted current individual transmission powers* (see "desired transmission quality requirements of each transport channel is fulfilled and not significantly exceeded. This means that required transmission power to meet quality requirement for all transport channels is as low as possible" recited col. 2 lines 63-67), *a method of resource optimization* (see "a method of calculating the number of bits to be punctured or repeated to achieve effective rate matching" recited col.1 15-17) *comprising a step of balancing said current individual transmission powers with respect to, for a given service* (see "Semi-static Rate Matching: this is used to balance the transmission power requirements of different services, which are multiplexed to one Common Composite Traffic Channel (CCTrCH)" recited col. 3 lines 11-14), a desired bit *error rate* (see "to achieve the desired Bit Error Rate BER" recited col. 3 lines 34-35).

Claim 8, *a transmission system* (fig. 1, "a schematic view of a UMTS network" recited col. 1 line 66) *comprising an emitting entity* (fig. 1 "UE 12" and "UE 14" or "mobile users 12, 14" recited col. 2 line 14) *and a receiving entity* (fig. 1 "Node B 16" or "base station BTS/Node B 16" recited col. 2 lines 14-15) *for transmitting simultaneously*

at a global transmission power a set of various multiplexed services (refer to fig. 1 and see "in a UMTS network in which a plurality of services of a single user having different transmission power requirements are multiplexed in one channel and the technique of rate matching is applied" recited col. 1 lines 46-49, noting that such "multiplexed in one channel" will necessarily result in *transmitting simultaneously at a global transmission power*) *having specific predetermined error rate requirements* (see "required to achieve a desired Bit Error Rate" recited col. 1 lines 53-54) *matching quality factors* (see "deriving for each service the Energy per Bit per Noise density E_B/N_o required to achieve a desired Bit Error Rate" recited col. 1 lines 52-54, noting that "$(E_B/N_o)_i$ indicates a QoS of service i" recited col. 8 line 21) *achievable with adequately adjusted current individual transmission powers* (see "desired transmission quality requirements of each transport channel is fulfilled and not significantly exceeded. This means that required transmission power to meet quality requirement for all transport channels is as low as possible" recited col. 2 lines 63-67), *the transmission system comprising resource optimization means* (fig. 2 "Rate Matching 45/55" means) *including means of balancing said current individual transmission powers with respect to, for a given service* (see "Semi-static Rate Matching: this is used to balance the transmission power requirements of different services, which are multiplexed to one Common Composite Traffic Channel (CCTrCH)" recited col. 3 lines 11-14), a desired bit *error rate* (see "to achieve the desired Bit Error Rate BER" recited col. 3 lines 34-35).

Claim 9, *in a transmission system* (fig. 1, "a schematic view of a UMTS network" recited col. 1 line 66) *comprising an emitting entity* (fig. 1 "Node B 16" or "base station

BTS/Node B 16" recited col. 2 lines 14-15) *and a receiving entity* (fig. 1 "UE 12" and "UE 14" or "mobile users 12, 14" recited col. 2 line 14, noting that Freiberg discloses "This entire procedure exists also in the downlink direction, ie from the BTS 16 to mobile 12 or 14" recited col. 2 lines 47-48) *for transmitting simultaneously at a global transmission power a set of various multiplexed services* (refer to fig. 1 and see "in a UMTS network in which a plurality of services of a single user having different transmission power requirements are multiplexed in one channel and the technique of rate matching is applied" recited col. 1 lines 46-49, noting that such "multiplexed in one channel" will necessarily result in *transmitting simultaneously at a global transmission power*) *having specific predetermined error rate requirements* (see "required to achieve a desired Bit Error Rate" recited col. 1 lines 53-54) *matching quality factors* (see "deriving for each service the Energy per Bit per Noise density E_B/N_o required to achieve a desired Bit Error Rate" recited col. 1 lines 52-54, noting that "$(E_B/N_o)_i$ indicates a QoS of service i" recited col. 8 line 21) *achievable with adequately adjusted current individual transmission powers* (see "desired transmission quality requirements of each transport channel is fulfilled and not significantly exceeded. This means that required transmission power to meet quality requirement for all transport channels is as low as possible" recited col. 2 lines 63-67), *the receiving entity* (fig. 1 mobile 12 or 14) *comprising resource optimization means* (fig. 2 "Rate Matching 45/55" means) *including means of balancing said current individual transmission powers with respect to, for a given service* (see "Semi-static Rate Matching: this is used to balance the transmission power requirements of different services, which are multiplexed to one Common

Composite Traffic Channel (CCTrCH)" recited col. 3 lines 11-14), a desired bit *error Rate* (see "to achieve the desired Bit Error Rate BER" recited col. 3 lines 34-35).

Freiberg does not expressly disclose the following feature (underlined part below) for all of above Independent claims 1, 8 and 9:

... balancing said current individual transmission powers with respect to an estimation, for a given service, of a difference between said specified predetermined error rate requirement and a measured current error rate. However, since Freiberg has already taught to perform the same *with respect to* achieving the desired Bit Error Rate PER as cited above, there would have been obvious and would have no difficult for Freiberg to do the same as what is shown in Higuchi.

Higuchi discloses a "transmission power control method and mobile communication system" (p1 left col. lines 1-2) comprising, for **claims 1, 8 and 9:**

balancing said current individual transmission powers with respect to an estimation, for a given service, of a difference between said specified predetermined error rate requirement and a measured current error rate (see "varying ... the amount of correction of the target reception power value, according to the difference between the detected reception error rate and the target reception error rate" recited p7 right col. claim 6 lines 3-8, and in tern "the transmission power can be controlled to a predetermined target value based on [the SIR or] the target reception power value" recited Abstract lines 7-9).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Freiberg by adding the method of Higuchi of adjusting transmission power per error rate difference in order to provide

- **Regarding Dependent Claims**

Freiberg discloses the following features:

Claim 2, *a method as claimed in claim 1, wherein the step of balancing the current individual power includes dynamically adapting rate matching parameters associated to the services, which are related to a number of bits to be repeated or punctured during transmission of said services* (see "... a method of determining for each service the number of bits to be punctured or repeated to provide rate matching" recited Abstract lines 3-5).

Claim 10, *a computer program product for a receiver computing a set of instructions, which when loaded into the receiver, causes the receiver to carry out the method as claimed in claim 1* (It is obvious to one skilled in the art that Freiberg's method will have to be performed with *a computer program product for a receiver computing a set of instructions, which when loaded into the receiver, causes the receiver to carry out the method,* noting especially that in Freiberg's method "the mobiles can calculate from the received values and the values stored in the look up table the number of bits to be punctured or repeated" recited Abstract last three lines).

5. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freiberg et al (US 6,788,657, Freiberg hereinafter) in view of Setty et al (US 2003/0103469, Setty hereinafter).

The present application is drawn to an "Adaptive Rate Matching Method".

Freiberg discloses a "universal mobile telephone system [UMTS] network with improved rate matching method" (col. 1 lines 1-3) comprising the following features:

Regarding Claim 4, *in a transmission system* (fig. 1, which "is a schematic view of a UMTS network" recited col. 1 line 66) *for transmitting simultaneously at a global transmission power, a set of various multiplexed services* (refer to fig. 1 and see "in a UMTS network in which a plurality of services of a single user having different transmission power requirements are multiplexed in one channel and the technique of rate matching is applied" recited col. 1 lines 46-49, noting that such "multiplexed in one channel" will necessarily result in *transmitting simultaneously at a global transmission power*) *comprising a set of transport data blocks of various predetermined sizes for transporting block-coded data on specific transport channels* (see "An additional requirement is that the semi-static rate matched transport block must fit into a physical channel having bits per frame N_{Frame}. One time frame is 10 milliseconds and contains N_s symbol bits where $N_s = 16 \cdot \sum N_{data_j}$" recited col. 4 lines 43-50) *having specific predetermined error rate requirements* (see "required to achieve a desired Bit Error Rate" recited col. 1 lines 53-54) *associated to quality factors* (see "deriving for each service the Energy per Bit per Noise density E_B/N_o required to achieve a desired Bit Error Rate" recited col. 1 lines 52-54, noting that "$(E_B/N_o)_i$ indicates a QoS of service i" recited col. 8 line 21), *which necessitate adequately adjusted current individual transmission powers* (see "desired transmission quality requirements of each transport channel is fulfilled and not significantly exceeded. This means that required

transmission power to meet quality requirement for all transport channels is as low as possible" recited col. 2 lines 63-67), *a method of resource optimization* (see "a method of calculating the number of bits to be punctured or repeated to achieve effective rate matching" recited col.1 15-17) *including a step of balancing said current individual transmission powers* (see "Semi-static Rate Matching: this is used to balance the transmission power requirements of different services, which are multiplexed to one Common Composite Traffic Channel (CCTrCH)" recited col. 3 lines 11-14).

Regarding claim 5, *the step of balancing the current individual transmission powers includes a step of dynamically adapting at code block size change rate matching parameters associated to the services, which are related to a number of bits to be repeated or punctured during transmission of said services* (see "... a method of determining for each service the number of bits to be punctured or repeated to provide rate matching" recited Abstract lines 3-5).

Regarding claim 6, *wherein the step of dynamically adapting at code block size change rate matching parameters associated to the services includes a preliminary step of determining groups within the set of transport data blocks, a same group comprising transport data blocks associated to quality factors, which may differ only within a predefined rage* (refer to fig. 2 and see "the steps to encode services with identical QoS requirements are shown within box 30, and identical steps to encode a set of different services are performed within box 31" recited col. 2 lines 29-32), *and a step of computing the rate matching parameters with respect to a predetermined rule corresponding to the associated quality factor of the group* (still refer to fig. 2, especially

box 30, and see, as a follow-up step to the above cited step, "rate matching step 45" recited col. 2 lines 36-37, and "the equivalent rate matching step 55 is shown in box 31" recited col. 2 line 38, and further "the rate matching factor for each service is calculated by $RF_i = DRF \cdot SRF_i$" recited col. 6 lines 4-5, noting the subscript "i" suggests that the RF is different from one service to another).

Regarding claim 7, *the step of balancing said current individual transmission powers includes a step of estimating code block size coding gains related to the transport data blocks for deriving individual quality factors matching said specific predetermined error rate requirements* (see "After the channel coding step, which is specific to the service I and is described by the coding factor (coding gain) CF_i, when the number of coded bit $N_{codi}=N_{biti} \cdot CF_i$. This value is the input to a rate matching step, the output of which is $(E_S/N_o)_i$, the QoS after the coding and rate matching" recited col. 8 lines 22-26).

Freiberg does not disclose the following feature:

Regarding claim 4, said power balancing is performed *with respect to the predetermined sizes of said transport data blocks*.

Setty discloses a "method and apparatus for controlling the transmission power in radio communication system" (p1 left col. lines 1-3) wherein "rate matching is applied" ([0002] line 12) comprising the following feature:

Regarding claim 4, balancing transmission power *with respect to the predetermined sizes of said transport data blocks* (see "adjusting the transmission

power of the system according to a relationship between the size of a Midample signal and the size of a data signal with a transmission burst" recited [0011]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Freiberg by adding the aforesaid step of Setty to Freiberg in order to provide an expanded method and system "for controlling the T_x power during the rate matching in a TDD system" as pointed out by Setty ([0005] lines 1-3), which was needed because "there are no provisions for controlling the T_x power in a TDD wireless telecommunication system" as Setty said ([0004]) and further "by reducing the T_x power requirements during rate matching, the overall power requirements of the wireless telecommunication system and the system's costs are reduced" ([0005] lines 3-6).

Allowable Subject Matter

6. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 3 appears to contain allowable subject matters, provided the Applicants overcome the 112 2nd paragraph rejection discussed above in paragraph 2. The closest prior art of Freiberg and Higuchi, as cited above in paragraph 4, provided conventional method of rate matching in a wireless communication system with transmission power adjustments or balancing for individual services to meet data error requirements. However, said closest prior arts, singularly or in combination, fail to teach the particular

and unique steps claimed in claim 3 of present Application regarding transmission power balancing and rate matching.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 2002/0115443 provides a method for controlling quality of service in a CDMA-based wireless system using static rate matching and power-offset dynamically.

US 2004/0018849 discloses a queue length-based data transmission for wireless communication wherein transmission power is adjusted in accordance with the amount of data in the queue.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Lai whose telephone number is 571-272-9741. The examiner can normally be reached on M-F 7:30-5:00 EST, Off alternative Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on 571-272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AL

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SUPERVISORY PATENT EXAMINER